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PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| Applicant's or agent's file reference NSM3422PCT | FOR FURTHER ACTION | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
|---|---|---|
| International application No. PCT/JP99/06174 | International filing date (*day/month/year*) 05 November 1999 (05.11.99) | Priority date (*day/month/year*) 10 February 1999 (10.02.99) |
| International Patent Classification (IPC) or national classification and IPC C07K 7/64, 14/705, A61K 39/21 | | |
| Applicant NISSUI PHARMACEUTICAL CO., LTD. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

| Date of submission of the demand | Date of completion of this report |
|---|---|
| 21 July 2000 (21.07.00) | 26 March 2001 (26.03.2001) |
| Name and mailing address of the IPEA/JP<br><br>Facsimile No. | Authorized officer<br><br>Telephone No. |

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP99/06174

## I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed

☐ the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the drawings:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☒ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/JP 99/06174

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | 1-8 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 3, 8 | YES |
| | Claims | 1, 2, 4-7 | NO |
| Industrial applicability (IA) | Claims | 1-8 | YES |
| | Claims | | NO |

2. Citations and explanations

Document 1: EP, 834564, A2 (SmithKline Beecham Corporation), 8 April 1998 (08.04.98) & JP, 10-179180, A

Document 2: Anne Brelot et al., "Role of the first and third extracellular domains of CXCR-4 in human immunodeficiency virus coreceptor activity", Journal of Virology (1997), Vol. 71, No. 6, pp. 4744-4751

Document 3: EP, 551689, A2 (Merck & Co., Inc.), 21 July 1993 (21.07.93) & JP, 5-170797, A
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Claims 1, 2 and 4-7

Document 1 discloses the gene sequence of human chemokine receptor CC-CKR5, known to be a principal cofactor in the invasion of HIV-1 into cells, and also the amino acid sequence and gene sequence of the murine chemokine receptor, and indicates that CC-CKR5 polypeptide can be used as an immunogen for producing antibodies against said receptor and that said antibodies can be used to inhibit HIV-1 infection.

Document 2 discloses neutralization of HIV-1 infection by an antibody against the extracellular domain of chemokine receptor CXCR-4.

Document 3 discloses cyclic human immunodeficiency

virus principal neutralizing determinant peptides, and indicates that ligands including cyclic peptides are useful in enhancing antipeptide, anti-HIV or HIV-neutralizing immune reactions.

Knowing that antibodies to the receptors inhibits HIV-1 infection, as disclosed in Documents 1 and 2 a person skilled in the art could easily select partial CC-CKR5 or CXCR-4 polypeptides as cyclic peptides in order to provoke an efficient neutralizing reaction as disclosed in Document 3, in order to produce a vaccine to produce neutralizing antibodies against HIV-1.

In addition, the position of the polypeptide can be appropriately selected from the extracellular domain.

Therefore, the invention as described in Claims 1, 2 and 4-7 could be derived easily by a person skilled in the art from Documents 1-3.